Drawing With Machines - a Report on the Workshop: Generative Drawing With Pencils, Paper, C++ and openFrameworks

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Abstract

The following is a short description of a workshop on generative computational drawing at ICCC'20. Generative drawing and making has a well established history in modern art. We organised the workshop as an opportunity to explore how such systems may exploit the explicit nature of code to generate new ways to make, draw and code for artistic expression. In the workshop we discussed the basic principles of generative computational drawing systems and explored practical hands on demonstrations of coding simple generative systems for art, music, audio and design using the popular C++ toolkit 'openFrameworks'. (http://openframeworks.cc)

Keywords

Generative Systems, Drawing, Art Theory, Artistic Research, Art Practice, Creative Coding, C++,

1. Introduction

Whilst the workshop for ICCC'20 was practical and hands-on in nature the hoped-for outcomes were actually centred on a deeper discussion of the nature of working creatively with complex, generative, computational tools. The discussion on practice necessitates a clarity and definition of a practitioners relationship to the creative process and hence the tools at hand.

The workshop attracted a diverse group of participants and the program was built to construct a common set of framework notions. The sessions began with a discussion of generative approaches to drawing from traditional media, taking in printmaking and weaving, noting the work of Sol Lewitt, Annie Albers, Vera Molnar and Jared Tarbel [1, 2, 3, 4]. Translating ideas to audio and video, from Mozart's dice music through the work of Printmaker Sol Lewitt [5], weaver Annie Albers and computational artist Vera Molnar to Carl Lostritto [6] and on to Brian Eno's generative video and sound using computer systems.

It is important to note that this workshop was originally proposed as an on-site all day face-to-face event aimed at a combination of sharing and discussion. These activities were to be interwoven with practical making and exploration of demonstration code examples provided as starting points. Example exercises, demonstration code and generative drawing building blocks
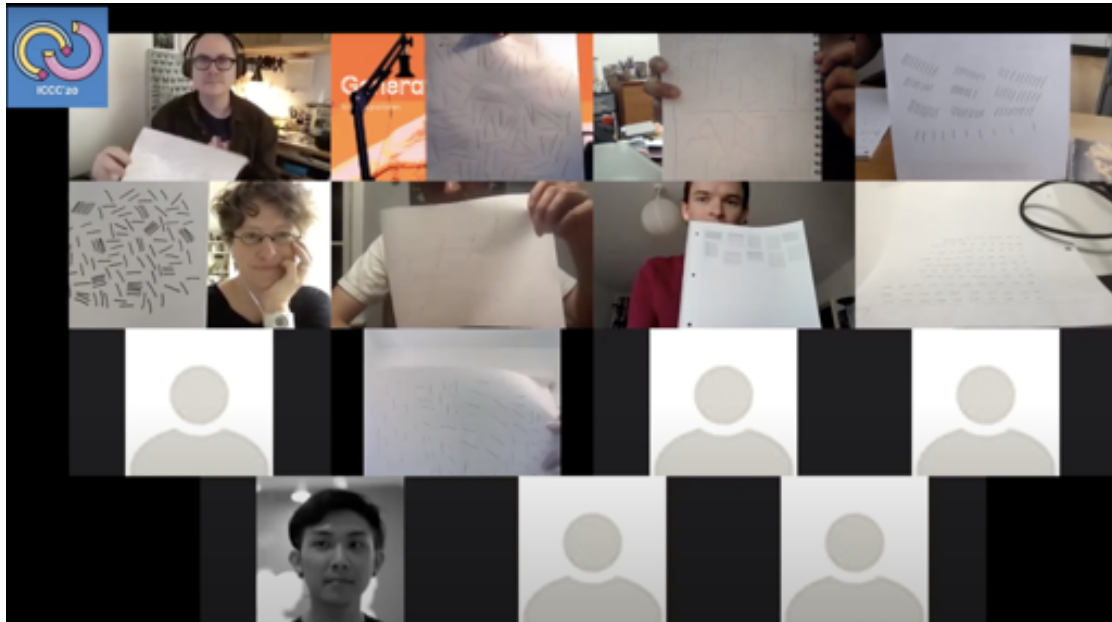
Figure 1: Screenshot of workshop in progress with participants sharing results from a directed generative-drawing exercise). Copyright the authors

were provided online in advance via a github repository and website featuring text, reading lists, links and computer source code. (https://generative-drawing.github.io) After the workshop a video of the complete first session was also made available via the art+code youtube channel (https://youtu.be/4Y5q3sZpZTQ)

2. Drawing and Coding: Encoding Drawing

The workshop was broadly designed for those with an interest in coding and a familiarity with basic development on Mac, PC or Linux computers. Though this was not intended to be exclusive in any way - the workshop was paced to enable those with little or no coding experience to explore and gain insights into working in a generative style. Demonstration code and examples were pre-prepared investigating several of the main principles of generative drawing algorithms and approaches. This enabled all participants to make their own audio or video/visual generative artworks in the course of the day.

Due to the changes necessitated by the spread of Covid-19, the workshop was moved to a remote online format. This necessitated additional changes to the form and flow of the workshop. We decided to switch between short talks, introductions, parallel work, discussion, and finally offline work. This meant practically that we started with a two hour group video session in the morning, and then had a two hour session in the late afternoon. In between, the group used Slack for sharing ideas and progress, messaging and help and support as the participants developed their ideas in code.

In the initial session, participants discussed theory and practical application of systems
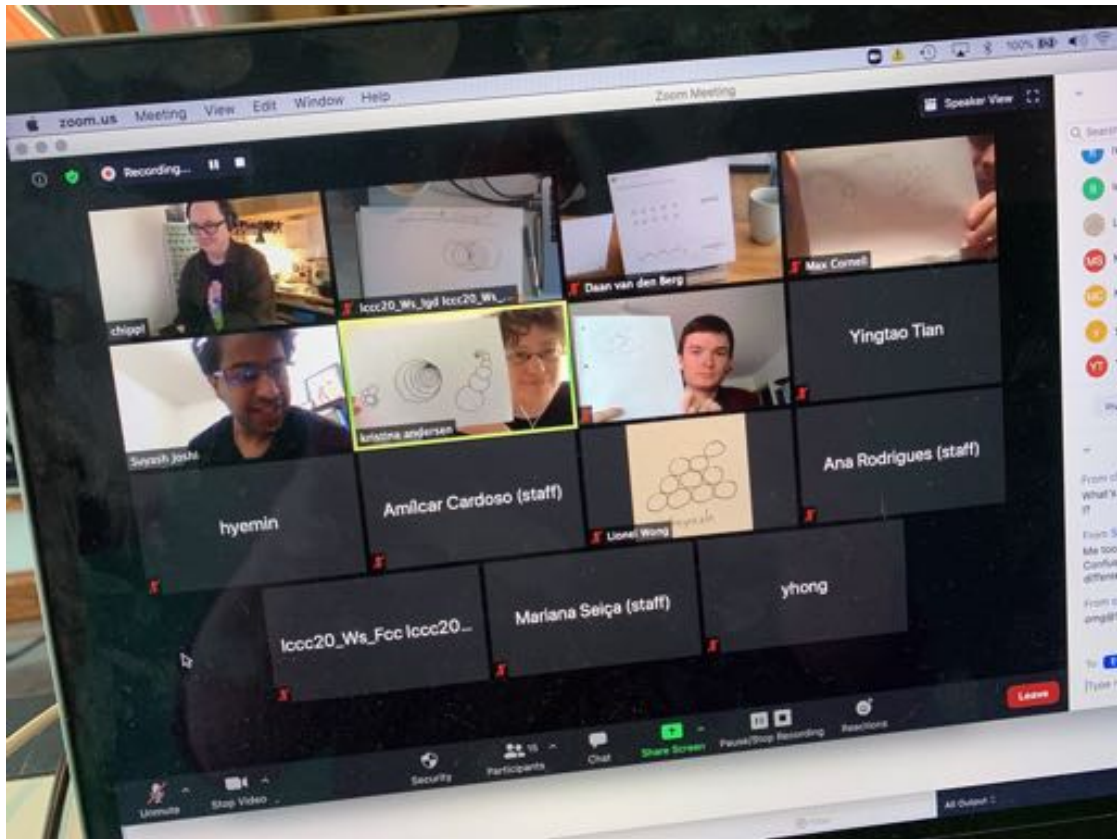
Figure 2: Screenshot of workshop in progress with participants sharing results from a generative-drawing exercise designed and led by a participant). Copyright the authors

working across material from creative practitioners from the field of music, audio, video and visual arts. Through the practice of systems of drawing translated into computational drawing, we discussed some of the mathematics and also the philosophical and artistic foundations of algorithmic and generative approaches to creation. Alongside this, there were practical demonstrations and experimentation with systems of coding drawing in computers.

Throughout the day we saw very different approaches in the work. The participants came from very different backgrounds and these different approaches were immediately visible from the exercises as can be seen below.

3. Shared Drawing Experiences

The central exercise of the day was to ask each participant to propose a drawing exercise in the form of a set of commands. See Exercise A in appendix 1 for an example of the first drawing exercise.

The group then worked individually and in parallel to execute the commands and share their drawings by holding them up to the camera. See Exercise B in appendix 1. This method of
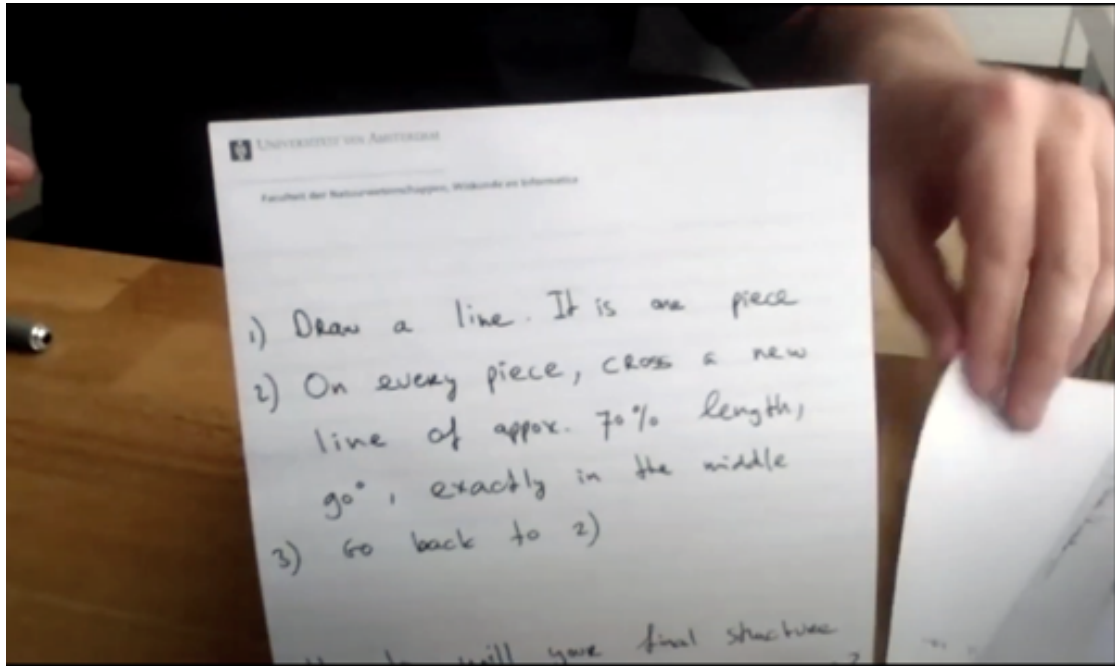
Figure 3: Screenshot of drawing rules designed by a workshop participant being shared with others as part of a group drawing exercise). Copyright the authors
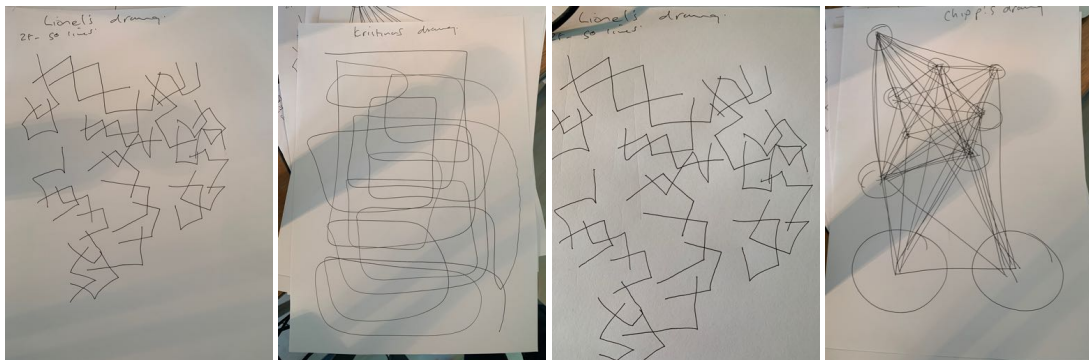

Figure 4: Screenshots of various drawings produced based upon rules designed by workshop participants. Copyright the authors

facilitating a together-apart action became one of our insights of the day: The simplicity of the action paired with the idea of working in parallel, created a group feeling and the use of the computer camera to share the outcomes, allowed the activity to be seamless and very enjoyable.

This budding sense of collegiate collaborations were built and strengthened though the work apart period in the middle of the day and the last session was primarily focused on each participant presenting their work and giving each other feedback. Toward the end of the first session two introductory code examples were demonstrated and the transition from writing and drawing with pencil and paper to drawing with code was discussed. During a midday
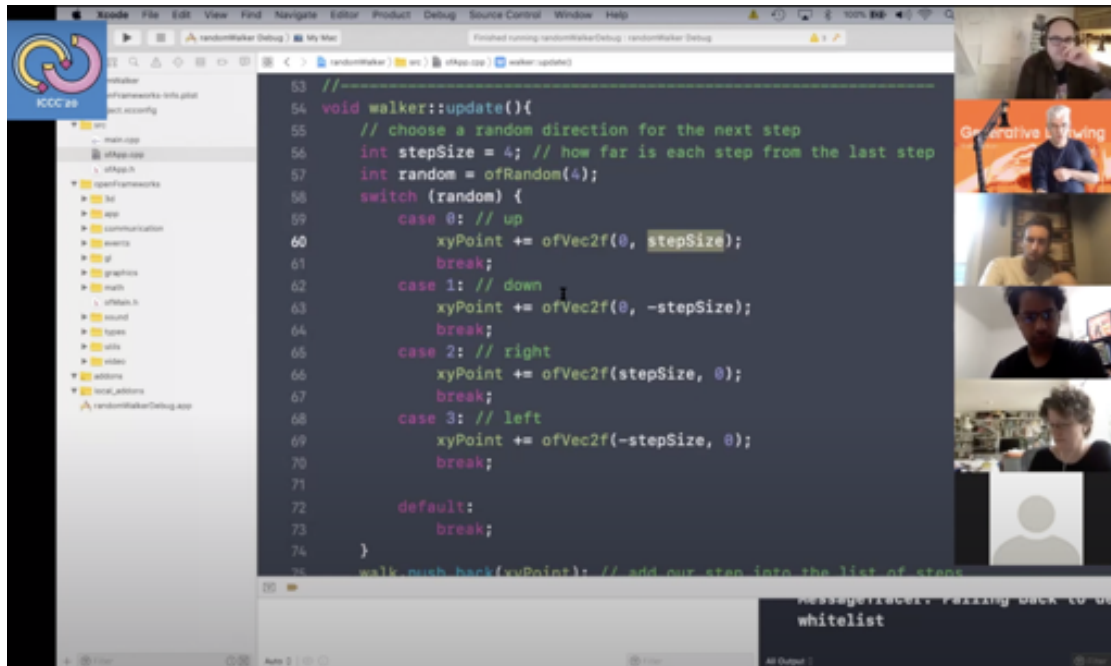
Figure 5: Screenshot of workshop in progress walk-through of an example generative code exercise). Copyright the authors

break participants and organisers exchanged messages and images through an online discussion board. In the afternoon session participants demonstrated and discussed their individual works, sharing ideas and observations, with several remarking on seeing their practice with code in a new light.

At the end of the day, everyone had not just "taken a line for walk", but also seen each other think along and discovered similarities and differences that reflected both towards the group exercises and maybe more importantly back onto each participants practice.

Acknowledgments

References

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A. Visual expression: generative drawing, weaving and pattern making : Workshop

Pick up a piece of paper and a pencil and draw;

A.1. Exercise A

1. 1) think of an integer x, between 1 and 10
2. 2) draw 100 lines on the paper x cm long
3. 2a) lines must not touch each other
4. 2b) lines must not touch the edge of the paper

Complete your drawing and compare it with other people.

A.2. Exercise B

1. 1) Think of a drawing system that follows simple rules and write them on a piece of paper
2. 2) follow your drawing rules to test and refine the drawing system
3. 3) read the system out loud to the group and then compare the drawings you have made